PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-013640
(43)Date of publication of application : 18.01.2002

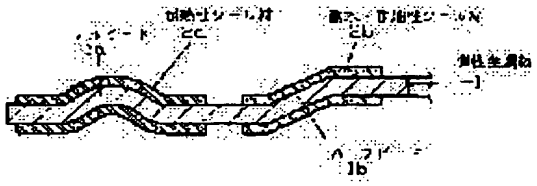
(51)Int.Cl. F16J 15/08

(21)Application number : 2000-195914
(22)Date of filing : 29.06.2000

(71)Applicant : UCHIYAMA MFG CORP
(72)Inventor : OKAZAKI YOSHIMICHI
NANBA TAKASHI
MATSUMOTO KENJI
TANAKA YOSHITAKA

(54) CYLINDER HEAD GASKET

(57)Abstract:
PROBLEM TO BE SOLVED: To provide a cylinder head gasket, having an arrangement suitable for characteristics of a rubber material, while combined with the shape of a bead, and capable of realizing high sealability at a low cost.
SOLUTION: In this cylinder head gasket A, formed by an elastic metal plate 1 provided with a bead, a full bead is provided on an combustion chamber opening part A1 of the elastic metal plate 1, a half bead is provided at the circumference of a through-hole A2, the full bead is coated with a heat-resisting sealing material 2a, and the half bead is coated with a waterproof oilproof sealing material 2b. As a result, uniform fastening pressure can be obtained, and deterioration and relaxation of stress can be prevented.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision of rejection]

[Date of requesting appeal against examiner's decision of rejection]

[Date of extinction of right]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Claim(s)]
[Claim 1] The cylinder head gasket characterized by making both sides of the bead of said through-hole coat with a deck watertight luminaire and an oilproof sealant while preparing a bead around combustion chamber opening and the through-hole of said elastic metal plate, respectively and making both sides of the bead of said combustion chamber opening coat with a heat-resistant sealant in the cylinder head gasket for internal combustion engines which consists of an elastic metal plate which prepared the bead, and a sealant.
[Claim 2] Said heat-resistant sealant is the cylinder head gasket of claim 1 characterized by coming to mix either expanded graphite, organic fiber, an inorganic fiber, an organic bulking agent, an inorganic bulking agent or synthetic-resin material by using a fluororubber as the main raw material.
[Claim 3] Said deck watertight luminaire and oilproof sealant are the cylinder head gasket of claim 1 characterized by consisting of minerals or organic fiber, and rubber material.
[Claim 4] It is the cylinder head gasket of claim 1 which the bead of said combustion chamber opening is a full bead which makes cross-section convex, and is characterized by the bead of said through-hole being a half bead which makes the shape of a cross-section step.
[Claim 5] The cylinder head gasket of claim 1 characterized by cheating out of the heat-resistant sealant prepared in the bead of said combustion chamber opening, and the deck watertight luminaire and oilproof sealant which are prepared in the bead of said through-hole as the arrangement from which the rubber quality of the material, a fiber material, the blending ratio of coal, a degree of hardness, or a thickness dimension differs with the front rear face, respectively 2 thru/or 3.
[Claim 6] The cylinder head gasket of claim 1 characterized by carrying out two or more sheet laminating of the cylinder head gasket by which coating of a deck watertight luminaire and the oilproof sealant was carried out to the heat-resistant sealant to both sides of the bead of said through-hole to both sides of the bead of said combustion chamber opening 2 3 4 thru/or 5.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Industrial Application] This invention relates to metal gasketing used for an internal combustion engine's cylinder head, and relates to the cylinder head gasket which formed the bead especially in the sheet metal of spring steel.
[0002]
[The contents of the conventional technique] Conventionally, the bead which becomes the metal plate which has elasticity from the shape of cross-section convex or a step is formed, the metal cylinder head gasket which carries out the seal of the plane of composition of an internal combustion engine's cylinder head and a cylinder block efficiently by this bead is proposed, and practical use is given. And in order to raise seal nature to the front face more, it is common to have coated the elastic material for seals which uses rubber material as a base material. (For example, JP,63-96359,A)
[0003]
[Problem(s) to be Solved by the Invention] However, the reduction of rigidity of the engine itself according to the engine formation of small lightweight in recent years, An engine engine's temperature rise benefits the cure against exhaust gas a problem. It becomes what cannot apply a homogeneous bundle pressure to a gasket easily that a cylinder block tends to be distorted by bolting in the former reduction of rigidity. In the temperature rise of the engine engine for the latter cure against exhaust gas In an exhaust side and an inspired air flow path, a temperature gradient arises remarkably, according to this temperature gradient, a thermal strain appears in the joint of the cylinder head, and a partial difference occurs in the planar pressure of the seal section. If heat-resistant high rubber material is used in order to decrease sharply stability required at degradation by heat to carry out the lifting seal of the stress relaxation and to cancel this, the elastic material for seals which uses as a base material the aforementioned rubber material prepared in that front face when it resulted in this condition becomes what raises a product price greatly, and is not realistic.
[0004] This invention is made in view of such a fault, and it aims at offering the metal cylinder HEGGASU blanket which can choose nothing and a bead configuration for the arrangement which suited the property of rubber material, and can demonstrate the high seal engine performance.
[0005]
[Means for Solving the Problem] If this invention is explained in detail based on a drawing, as shown in drawing 2 , it is the cylinder head gasket A which consists of the cylinder head for internal combustion engines, an elastic metal plate 1 with which the bead with which it is equipped between cylinder blocks was prepared, and a sealant. The bead which projects separately, respectively is prepared around the through-holes A2, such as the combustion chamber opening A1 of said elastic metal plate 1, a hydrospore, or an oil gallery. While making both sides of the bead A1 of this combustion chamber opening 1 coat with heat-resistant sealant 2a which uses a fluororubber as the main raw material, it is characterized by making both sides of bead 1b of said through-hole A2 coat with the deck watertight luminaire and oilproof

sealant 2b which consists of an inorganic fiber and rubber material. Moreover, it is characterized by forming bead 2a of the combustion chamber opening 1 here in the full bead which makes cross-section convex, and forming bead 2b of said through-hole A2 in the half bead which makes the shape of a cross-section step.

[0006]

[Embodiment of the Invention] The cylinder head gasket A which becomes by this invention carried out coating arrangement of the sealant which consists of rubber material which has the respectively optimal property to the bead prepared around the combustion chamber opening A1 and a through-hole A2 separately as mentioned above, respectively, and has prepared the deck watertight luminaire and oilproof sealant 2b which consists of an inorganic fiber and rubber material heat-resistant sealant 2a which uses a fluororubber as the main raw material to bead 1b of a through-hole a2 in bead 1a of the combustion chamber opening A1.

[0007] The above mentioned heat-resistant sealant 2a is using the fluororubber as the main raw material, mixes either expanded graphite, organic fiber, an inorganic fiber or an organic bulking agent, an inorganic bulking agent or synthetic-resin material to this, and is formed in it. Although this fluororubber has the outstanding thermal resistance which can bear 250 degrees C in 230 degrees C and max by daily use, it is expensive, and it is holding down the product price, without mixing the ingredient shown below and reducing that engine performance. It is the material which expanded graphite made the oxidant act on a natural graphite, kish graphite, or pyrolytic graphite, and formed it in it, was excellent in 500 degrees C with the oxidizing atmosphere, and was extremely excellent in thermal resistance with 2000 degrees C with nonoxidizing atmosphere, and coexistence of heat-resistant ability and low-pricing can be aimed at by using locally to the part which mixes these here and starts convex bead 1a. Moreover, as organic fiber, rock wool, an aramid fiber, cellulose fiber, polyester fiber, a polyamide fiber, etc. can be adopted, and glass fiber, potassium titanate, etc. are used as an inorganic fiber. Furthermore, carbon black is mentioned in an organic bulking agent, and a silica, clay, or a calcium carbonate is mentioned in an inorganic bulking agent. And it can choose from polyamidoimide, PTFE (Pori tetrapod fluoro ethylene), etc. in synthetic-resin material.

[0008] On the other hand, although NBR (2 tolyl butadiene rubber) is generally used, the rubber material of a deck watertight luminaire and oilproof sealant 2b As an inorganic fiber which acrylic rubber, silicone rubber, polyisoprene rubber, chloroprene rubber, etc. are chosen as others, and is mixed to this The fiber material except the asbestos which consists of glass, a ceramic, rock wool, slag wool, a fused quartz, a whisker, boron, carbon, a metal, etc. is used. As organic fiber It responds to the engine performance which chooses a polyamide system, a polyolefine system, a polyester system, a polyacrylonitrile system, a polyvinyl alcohol system, etc., and is called for.

[0009] In addition, in formation of the bead prepared in order to raise the local planar pressure by compression to the elastic metal plate 1, to form bead 1a of a cross-section convex full bead, in order to harness a spring property, and to form in the half bead which benefits planar pressure adjustment for the shape of a step in bead 1b of said through-hole A2 is recommended by the combustion chamber opening A1 put to high pressure and an elevated temperature. Although the sealant prepared in such beads 1a and 1b arranges heat-resistant sealant 2a, and a deck watertight luminaire and oilproof sealant 2b, respectively Bead 1a of said combustion chamber opening A1, and bead 1b of said through-hole A2 It is also possible to consider as the arrangement from which the rubber quality of the material, a fiber material, the blending ratio of coal, a degree of hardness, or a thickness dimension differs with the front rear face, respectively. For example, it has high structure of the versatility which you make it differ in a degree of hardness or thickness with the front rear face, or various combination, such as changing loadings, can be realized, and is embraced suitable for various demands.

[0010] Although the cylinder head gasket A which is the above, and was made and formed was explained in the condition of being equipped in a singular as drawing 1 showed In addition, the permutation pile of two sheets with which each of said beads 1a and 1b as shown by drawing 3 laps exactly, Or like drawing 4 , carrying out the laminating of two or more sheets, such as a reverse train pile which laps in a reverse configuration, and also making them arrange can be carried out, and each of said beads 1a and 1b has the versatility which can respond to various

demands.
[0011] Moreover, in coating of the deck watertight luminaire and oilproof sealant 2b prepared in bead 1b of the shape of heat-resistant sealant 2a and a cross-section step prepared in cross-section convex bead 1a, although it is easy also efficiently [forming with print shaping by spreading shaping using masking, screen-stencil, or decalcomania], and in activity and is recommended, it is scrupulous and does not limit to these.
[0012]
[Effect of the Invention] By coating of the bead separately prepared in the elastic metal plate of this invention, respectively, and a sealant, a homogeneous bundle pressure is given to a cylinder head gasket A to distortion of the cylinder block by bolting, and even if it is in an excessive temperature gradient, the planar pressure of the seal section is kept constant. Moreover, while preventing degradation by making the arrangement which suited the property of rubber material and preventing stress relaxation, stability and concordance nature are maintained for a long period of time. thus -- even if it uses the expensive fluororubber -- a part required to carry out a seal -- initial-complement ****** -- the role which a product price can be made to fall sharply since things are sufficient, and is played in lightweight-ization will also become large.

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] It is the sectional view showing one example of this invention.
[Drawing 2] It is the top view of drawing 1 .
[Drawing 3] It is the sectional view showing other examples of this invention.
[Drawing 4] It is the sectional view showing other examples of this invention.
[Description of Notations]
A Cylinder head gasket
1 Elastic Metal Plate
A1 Combustion chamber opening
A2 Through-hole
1a Full bead
1b Half bead
2a A heat-resistant sealant
2b A deck watertight luminaire and an oilproof sealant

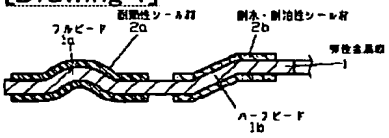
[Translation done.]

* NOTICES *

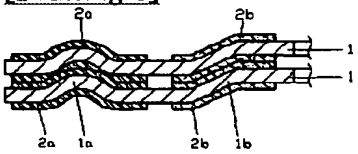
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

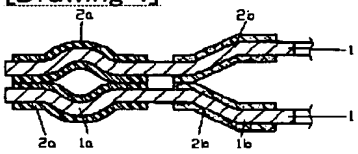
[Drawing 1]



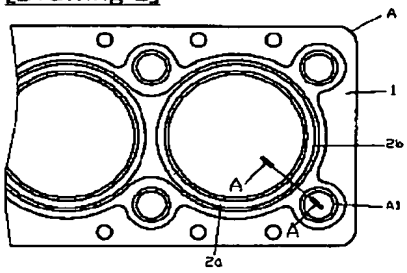
[Drawing 3]



[Drawing 4]



[Drawing 2]



[Translation done.]